Accelerator Systems Division Highlights Ending September 3, 2004

ASD/LANL: Warm Linac.

ASD/JLAB: Cold Linac

ASD/BNL: Ring

All purchase orders for WBS 1.5 have been put on hold to assure that we remain within the authorized BA. Additionally, all credit card orders for the WBS 1.5 Ring System, travel (foreign and domestic) and truck shipments from BNL to SNS/OR are on hold. We will continuously review the BA situation thru September and make changes on a case by case basis.

Larry Hoff (BNL/SNS Controls Group Leader) is at Oak Ridge for a second week to assist ASD with testing and commissioning operations.

We received authorization from ASD to proceed with magnetic measurement work on the four (4) 36Q85 rad hard quadrupoles. K. Mirabella is working with ASD on PCR processing/approvals.

Chicane #1 has been measured with the first set of Z-bumps. Data indicates that a second set of bumps will be required. Based on a modified design, new z-bumps are being machined in our Shops on a priority basis.

The Diagnostics Production Plan was circulated to principal parties for comments and revisions.

Shipment of PFN units #8 – 11 has been delayed one week because of the Republican National Convention traffic in NYC. These units are ready to ship and should leave the vendor's facility early next week. The remaining three PFNs are still on track for completion by 10/1.

Work continues on a test set-up to measure the overall impedance of one complete extraction magnet assembly (coated ferrite magnet in vacuum chamber) with its PFN. Our aim is to have system measurements complete in time for ASAC.

The QMM and Tune Kicker vacuum chambers were delivered to the Vacuum Group for TiN coating last week. The units have since been assembled together and made ready for coating.

H. Hseuh has finished TiN coating the #4 extraction kicker magnet.

Design work for the valve supports in the Ring arcs is underway.

Design work is underway for a new quad-doublet lifting fixture. Two will be made; one for BNL and one for OR.

Work on the Extraction Straight Section installation drawings is underway. The RTBT installation drawings are still in final checking.

BNL designer Robert Ritter is working on a Pro-E drawing of the 36Q85 radiation hardened quad design. Design files will be shared with ASD's K. Potter.

The SNS shipping container containing with RF anode module, RF anode rack, Danfysik 8000 PS, RF electron tube and the long injection kicker magnet assembly is on hold due to spending restrictions. The new ship date is October 5th.

BNL's upcoming travel (in September) to IE Power has been canceled due to spending restrictions. First article power supply units will be accepted by ASD's K. Rust.

Fiber Materials, Inc. (foils) and Pioneer Steel (17D224 core) have been added to our weekly vendor call list.

Work is underway to define budgets, plans and BA for FY05.

Controls

Installation

Craft Snapshot 8/31/04

ASD productive craft workers	**63.0**
Foremen (Pd by 15% OH)	5.0
AMSI management (Pd directly)	3.0
TOTAL AMSI WORKERS	71.0
Less WBS 1.9, 1.2 etc	**8.0**
Less absent	**3.0**
TOTAL PD BY ASD/ORNL DB WPs	**52.0**

Accelerator Physics

Cryomodule medium beta position #3 (Serial number MB04) was cooled down to 4.2 K.
Cavities 1 and 3 were powered up to 11 MV/m and 400 microseconds pulse length at 1 pulse per second repetition rate. No conditioning of the couplers was necessary, as the fields were reached without vacuum events. Field stabilization was attained via the LLRF system.
Cavity #2 had faults in both the coupler vacuum gauges (Cold Cathode Gauge) and could not be powered. This will be rectified on 9/7 and tests will continue through the week until 9/ 12.

Operations

Worked on the closeout of the Pre Start Action Items for the DTL 4-6 and CCL 1-3 ARR

Five Operations Procedures were written or modified, reviewed and approved.

The Accelerator Safety Envelope in the SAD was modified, reviewed and approved.

We met with the local representative of the ARR committee on Friday and presented the ASD responses to the Pre-Start Action Items. All responses were accepted by the local representative. We expect authorization to commission DTL 4-6 and CCL 1-3 on Tuesday September 7.

Operated the Front End Systems, delivering beam to the MEBT Beam Stop for pre-commissioning turn-on studies.

Certified the SCL Tunnel as a Radiation Generating Device for SCL Processing

Participated in turn on and processing of the first SCL Cryomodule

Operations staffed the Front End Control room 24/7 for testing/processing and monitoring of the LHe in the Linac tunnel

Ion Source

We are currently testing the ion source that has a modified cesium collar, which is isolated so its potential can be varied. When operated at the same potential as the ion source, the current output shows a remarkable improvement over the LBNL configuration, up to 60 mA average pulse current with 50 kW RF power. The emittance is currently being analyzed; initial results indicated a significant increase.

We have installed two Ross grounding rods on the Big Blue Box and modified the JHA accordingly. The grounding rod for the main platform contains a hard and a soft ground in case the 0.5 uF cap needs to be discharged.

Survey and Alignment

Work continued in the Linac elevation re-observation campaign. Network planning began for the extension of the campaign into the Ring. The presence of additional installed equipment has significantly increased the time required

In the magnetic measuring area, aligned HEBT QV15 and DCV15 on the support raft. Started alignment of QV17 and DCV17 on the respective raft.

Last night on overtime we optically measured one core vessel insert number 507-1 which I believe goes into beam line one. We performed this task on authorized overtime from target. We now have one more core vessel insert in house to be measured and this will happen on Tuesday of next week. This brings the total of measured core vessel inserts to 12 of the 18. Four of these will be guided and requiring tighter control for dimensional accuracy.

We attempted to align MB 5 and 6 cryo-modules. We began alignment on these two modules on Wednesday and as a result of a number of issues concerning hardware we were not able to complete either cryo-module. Furthermore, on Thursday the LINAC tunnel was shut down early for RF testing resulting in our crew having to move out of the tunnel and stop work on the cryo-modules. We will resume work on Tuesday if the RF testing is complete.

Over the past several days an alignment team has been assisting with the hot cell assisting in the placement of the target cart rails and measuring the deflection of the outer support cylinder.

In the Robotics area, S & A technicians continued to align core vessel insert.

S & A has received new information from BNL and is in the process of calculating a significant number of additional component stand bolt holes.

Our monthly elevation measurements of the RTBT Floor indicate a change of 6mm from 13 July to 13 August. The lowest recorded point is at the RTBT Tunnel Target Interface and is now 6.804 inches below design height. For those who would like to view our latest slide show of the RTBT Settlement, please contact Joe Error.

Mechanical Group

After struggling for a while to repair and keep flow meters operational and chasing all of the remaining minor water leaks, the RCCS systems for both the DTL and CCL are running nicely. We have had only one flow meter drop out in the past 3 days and expect the systems to continue to clean-up. The addition of the de-ox bottles to the polishing loops seems to have helped as well as the repair and calibration of most of the water quality sensors. We also have colleagues from INR in Russia visiting to compare and refine an RCCS computer model which they have been working on for our use. When finished, we will be able to simulate the water systems response to varying cavity conditions.

Some minor additional shielding was installed in the Linac tunnel per simulations and subsequent recommendations by Irina Popova. RF systems and are being brought on-line for the start of commissioning with minimal problems and cavity re-conditioning has begun.

The Front End system has been turned on and beam has been delivered to the MEBT beam dump.

Ring Systems Installation

- The RING “D” arc Half-Cell D6 was installed.
- The RING “D” arc Qtr-Cell D5 was installed.
- The RING “D” arc was put under vacuum.
- The third RF Cavity was set in place.
- The grounding cables were installed in all four RING arcs.

- The diagnostic cable installation in the HEBT tunnel continued.

Water Systems Installation

- Installation of the DI piping to the first half of SCL-ME7 continued.
- Installation of the SCL QMCS header continued.
- Installation of the HEBT Service Building PS cooling lines continued.
- Water maintenance activities this week included testing a new trim valve on the RCCS-3 system. The test results were not satisfactory and the trim has been removed and will be sent back to the manufacturer for correction.

Magnet Task

We have two 21Q40/27CD30 rafts assembled and aligned that are now ready to go to the tunnel.

We have measured 13 8Q35's and chosen six for assembly onto Rafts. Three rafts are assembled, two are aligned.

We are awaiting beam tubes.

We have also started moving some equipment into the CLO.

Electrical Group

SCL modulator ME-3 check out completed into resistive load.

SCL modulator ME-4 installation started – enclosure has been installed and AC wiring is in progress. Modulator tank is ready to install.

Installed 50 additional magnet corrector power supplies in Ring Service building, for a total of 80 (of 148).

Final cable pulls of modulator area SCL ME-3 are scheduled to be completed in the next 2 weeks.
AC power and cable pulls ongoing in SCL ME-4 area.
Diagnostic cable terminations are ongoing in HEBT.

Terminated coax and re-installed waveguide for RF group.

Corrected AC panel wiring neutrals/grounds in warm linac klystron gallery.

Repaired faulty circuit breaker in warm linac klystron gallery.

HPRF

Linac

Resolved waveguide problems for RF testing of ME-3 cryomodule cavities. Waveguide connections to ME-3 power couplers made; ready for cavity testing late on the 2nd. Burned out the group during this effort.

Testing of ME-2 klystrons and transmitters under way, hoping to finish HPRF, controls, timing and epics integration in a couple of weeks.

Preparing the last 11 klystrons for placement in the gallery.

CCl-4 HPRF testing into shorted waveguide on hold until a convenient time.

Waiting for more cyro power couplers from JLab.

Supporting operations during commissioning run.

Ring RF

Surveyed equipment presently on hand from Brookhaven

Determined an anticipated thermal load within the Ring RF Control Room

LLRF

Cryo Group

Continue stable operation o the Cryo Plant

Level CM at 90% automatic mode

Power into cavities

Start production of FT's for the 2K Cold box

Utube production average 1 per day

Beam Diagnostics

BPM:
All BPMs are ready for beam.

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All BCMs are ready for beam. The beam stop was just installed and will be calibrated next. The order for the balance of the linac BCM digitizers has been delayed to October 2004 due to FY04 BA limitations. A PCR has been submitted that transfers some BCM scope from BNL to ORNL as documented in the production plan.

D-Box:
Motor control has been integrated into the Emittance Scanner software. A clock circuit in the ICS digitizer failed. There is no spare, so this will be addressed by the vendor by next week. Work will continue on the electron collector through next week.

Wire Scanners:
All wire scanners are repaired, installed and ready for beam, including 3 shorted wires that appeared after pump down. They all have been checked through the MPS interface.

Faraday Cups:
All Faraday cups are ready for beam. The MPS has been tested through to the interface with controls.

BLM:
Ion chambers and Neutron detectors are ready for beam. All channels have been tested with MPS. All thermal neutron detectors have been tested offline and testing in the tunnel with a Californium source is also complete. Four of the eight units are installed and ready for beam. A complete calibration report is available that covers the fast neutron detectors, the thermal neutron detectors and the solid state neutron detectors.

BSM:
All BSMs are installed and ready for beam. The effect of fields from the nearby quads has been characterized and the effect is predictable and agrees with theory.

Misc:
We completed the latest base build image for deployment. This includes the first major change which is that the "diagnostics" user will now be a power user and not an administrative user. A new home page was added that allows anyone to pull up the web and get to the elog and net reg.
Some HEBT device names have been changed for consistency.